REMARKS/ARGUMENTS

I. Introduction

Claims 1–6, 8–16, 18, 19, and 21–32 are pending in the above application.

Claims 1–6, 8–16, 18, 19, and 21–32 stand rejected under 35 U.S.C. §102(e).

II. Amendments

The applicant has canceled claim 21 without prejudice or disclaimer. Applicant has amended independent claims 1 and 14 to more clearly claim the invention in view of the Examiner's objections. Applicant has introduced a new dependent claims 33 and 34 to more specifically claim the relative pressures between the operation of the mass selection device and the multipole. Applicant submits that new dependant claims 33 and 34 are fully supported from the specification as originally filed (see page 10, lines 9–18). Applicant has made minor voluntary amendments to dependant claims 2, 5, 8, 9, 10, 13, 22, and 23 to be consistent with the amendments to independent claims 1 and 14 and to accommodate claim dependencies on new claims 33 and 34.

III. Rejection Under 35 U.S.C. §102(e)

Claims 1–6, 8–16, 18, 19, and 21–32 stand rejected under 35 U.S.C. §102(e) as being anticipated by Whitehouse et al. (U. S. Patent No. 6,011,259). Applicant respectfully traverses this rejection. Anticipation under 35 U.S.C. §102 requires that each and every element of the claim be disclosed in a prior art reference as arranged in the claim. See C. R. Bard, Inc. v. M3 Sys., Inc., 157 F. 3d 1340, 1349, 48 USPQ 2d (Fed. Cir. 1998); and Connell v. Sear, Roebuck & Co., 220 USPQ 193, 198 (Fed. Cir. 1983).

Claims 1 and 14 have been amended to clearly set forth that the method and apparatus of this invention provide for a continuous stream of ions to a mass selection device, and that the mass selection device provides a continuous stream of precursor ions of a selected mass to charge ratio of interest to the multipole. The mass analysis in the mass selection device is now more positively claimed. Furthermore, the operation of the multipole as a collision cell is now stated to be at a higher pressure than the mass selection device.

In relation to the main independent claims the Examiner stated that Whitehouse et al. teaches a mass spectrometer device and method comprising an electrospray ion source (1), a plurality of multipoles (110 and 111), which may be a quadrupole, octapole, or higher rod number device, having an RF and AC field applied thereto (Col. 12, Lines 22–29 and Col. 14, Lines 38–Col. 15, Line 19) for the repeated selection, trapping and fragmentation of ions on their m/z basis (Col. 21–22), a collision gas multipole (Col. 11, Lines 19–50) where the collisions occur in the multipole at a resonant frequency to excite desired ions, a modulation means for adjusting the applied alternating current (Col. 16, Lines 47–50), and a detector (47) where the signal produced from many data sets of mass spectra is collected and passed to an analysis means where alternating data sets are subtracted from others to screen parent and daughter ion peaks (Col. 15, Line 5–19).

The Examiner, in this analysis, has combined a number of separate examples and alternative embodiments from the Whitehouse et al. patent, in particular, Figure 1 of Whitehouse et al. is used to describe examples of ion transmission modes: Continuous Ion Beam Operation starting at column 12, line 21; CID Fragmentation with Continuous Ion Beam Operation starting at column 14, line 27; and CID Fragmentation with Interrupted Ion Beam Operation starting at column 16, line 25. The alternative embodiment of Figure 4, starts at column 21, line 26 and continues to column 22, line 27, can be operated in a single pass continuous beam mode (starting at column 21, line 42) or with ion guide 110 in a wide m/z range trapping mode and ion guide 111 in a m/z selective trapping mode (starting at column 22, line 3). The Examiner relies on the comment in Whitehouse et al. (column 22, lines 23–27) that the "ion guide m/z selection

and ion fragmentation techniques described in previous sections can be applied to multipole embodiment shown in Fig. 4 to achieve most of the equivalent and even some additional MS/MS^n analysis performance capability" to combine these separate examples and embodiments.

Applicant submits that this statement, although applicable to the invention of Whitehouse et al., does not apply to the invention of the present application, where these examples and embodiments (ion transmission and trapping) are mutually exclusive.

In particular, the embodiment of Figure 1 of Whitehouse et al. is described by the applicant in the Background of the Invention, page 4, line 13 to page 5, line 27; there is no mass selection before fragmentation in ion guide 16. Figure 4 of Whitehouse et al. is primarily used in a trapping mode (column 21, line 54 to column 22, line 22) "[d]ue to the higher pressure in ion guide 110 and using techniques such as resonant frequency excitation, ion fragmentation can occur due to CID if ions with the neutral background gas within ion guide 110. Voltages can be applied independently to ion guides 110 and 111, so both ion guides can be operated in a variety of trapping or transmission modes with different offset potentials or m/z selection." The device of Figure 4 in Whitehouse et al., when operated in its trapping mode is mutually exclusive from the device of Figure 1 of Whitehouse et al., in terms of applicant's invention. Figure 4 of Whitehouse et al., is non-continuous in its trapping mode of operation. Moreover, the higher pressure of ion guide 110 would not enable it to perform as a mass selection device as claimed in the instant application.

For anticipation, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Moreover, the elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Applicant submits that the disparate examples and embodiments of Whitehouse et al. of Figures 1 and 4 do not show the identical invention as now claimed of the present application, nor are the elements of these examples and embodiments arranged as

required by the claims; these are mutually exclusive examples and embodiments for purposes of applicant's invention and represent different references.

Even if the examples and embodiments of Whitehouse et al. are combined as the Examiner has done, applicant submits that the claims as amended distinguish over Whitehouse et al. In particular, Whitehouse et al. does not show a method and apparatus as now claimed for:

(1) creating a continuous stream of ions in said substance and supplying the stream of ions to a mass selection device;

(2) performing a mass analysis of the stream of ions in the mass selection device to select precursor ions of a selected mass to charge ratio of interest;

(3) transmitting from said mass selection device a continuous stream of the precursor ions of the selected mass to charge ratio of interest;

(4) supplying the continuous stream of the precursor ions from the mass selection device and a collision gas to a multipole and providing an RF signal to the multipole, the multipole is operated at a higher pressure than the mass selection device and functions as a collision cell;

(5) fragmenting said precursor ions in the RF multipole by collisions with the gas molecules, in order to form primary fragment ions;

(6) supplying additional alternating current to the multipole at a frequency selected to cause resonance excitation of a desired primary fragment ion mass-to-charge ratio, whereby ions with said desired primary fragment ion mass-to-charge ratio are excited and undergo collisions with the gas molecules causing production of secondary fragment ions;

(7) modulating the alternating current signal applied in step (6) whereby periods in which said alternating current signal is applied alternate with periods in which the alternating signal is not applied; and

(8) detecting the ion signal after fragmentation with a mass spectrometer and collecting one set of data for one spectrum, representative of the ion spectrum when the alternating current signal is applied and another set of data for another spectrum, representative of the ion spectrum when the alternating current signal is not applied,

wherein said other spectrum can be subtracted from said one spectrum, to generate a subtracted spectrum showing the secondary fragment ions without the presence of the primary fragment ions except for any said primary fragment ions which are generated by step (6).

Consequently, Whitehouse et al. does not describe, either expressly or inherently, the limitations of independent claims 1 and 14, as amended, and therefore cannot anticipate claim 1 or claim 14. The remaining claims depend from either claim 1 or claim 14 and include all the limitations of the independent claims. Therefore Whitehouse et al. cannot anticipate these claims.

Applicant submits that this case is in condition for allowance. However, should the Examiner have any concerns with the claims as amended, applicant invites the Examiner to call the undersigned at (416) 957-1697 to discuss the case and avoid the expense and time of issuing a further communication.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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